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WILDLIFE TRAINING AND EMPLOYMENT

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During the last two decades wildlife management has gained in stature as a profession. Concurrently many American colleges and universities have added to their curricula subject matter pertaining to the conservation and management of wildlife resources. Most of the technicians now employed by wildlife-conservation agencies are college graduates; many have advanced degrees.

The number of educational institutions offering courses in wildlife management or in closely related fields is constantly increasing, and it is probable that some colleges or universities have been omitted in the appended list of 53 schools. Relatively few of these institutions have separate departments of wildlife management; most of the work is offered in departments of zoology, forestry, and agriculture.

There has been a significant increase during the past decade in the attention that institutions give this work. Expansion is shown in the number and variety of courses offered, in enlarged staffs, in more and better laboratory facilities, in acquisition of experimental areas, in numerous cooperative agreements between Federal and State agencies, and in other ways.

No attempt has been made thus far by any agency to rate or accredit institutions offering wildlife training, as is done by the Society of American Foresters for schools in forestry. Such evaluation is neither the purpose of this leaflet nor the function of a Government agency.

It is suggested that the prospective wildlife student write to the school or schools (table 1) in which he may be interested, to get information about courses available, degrees granted, and other details. For further information he is referred to the bibliography at the end of this leaflet, which lists articles and reports on training and professional opportunities in the wildlife field.

Note—This leaflet supersedes Wildlife Leaflet 296, Colleges and Universities Offering Courses in Wildlife Management (Revised June 1950).

PREPARING FOR WILDLIFE WORK

It is impractical to give here detailed information on the varied training required of, or useful to, wildlife workers. The following paragraphs merely outline broadly the kinds of knowledge generally recognized as most valuable in wildlife research, management, administration, teaching, extension, photography, and art work.

Wildlife management, in its broad sense, is of interest to many American groups: (1) Those engaged in professional wildlife work; (2) those enjoying the pursuit of game species for sport and recreation; (3) trappers and those engaged in fur production, manufacture, and trade; (4) those profiting financially from the sale of hunting rights, sporting goods, cameras, and binoculars; (5) those concerned in the many enterprises incidentally connected with recreation and outdoor enjoyment; and (6) those interested from the esthetic standpoint, deriving pleasure from observing the many forms in their natural habitats.

The niche a prospective student may eventually fill in the field of wildlife management is likely to depend upon a great many factors both tangible and intangible; certainly his interests, enthusiasm, capabilities, and the amount and type of training received, will be involved. With greater demands being made on wildlife resources by a rapidly increasing human population, new fields of employment can be expected and new approaches will be needed. The ability to work with people and to express oneself clearly is important to wildlife personnel in all phases of the work.

Research

Every phase of wildlife research requires a knowledge of the subject represented by basic and some advanced courses in zoology and botany. Specialized research requires still more advanced work, particularly in the branch in which the prospective employee is interested. The goal of anyone interested in wildlife research as a profession should be to get the best possible technical training plus practical experience in field and laboratory.

Research in the many aspects of wildlife management -- census, physiology, habitat requirements and improvement, agricultural relations, improved harvesting techniques, and others -- obviously demands wide knowledge of ecology and its application on aquatic and terrestrial areas. These phases of wildlife research will undoubtedly see much development in the future.

Research on the life history of birds and mammals requires the ability to identify a wide range of animals and plants, and a knowledge of the breeding, feeding, and nesting habits and the daily and seasonal movements of the species; predation, disease, and parasites; forestry and agriculture; soils; and the physical factors of the environment.

Food-habits research requires training in varied fields to enable the worker to recognize fragments of plants, seeds, mammals, birds, fishes, reptiles, amphibians, and invertebrates, in all stages of maturity. Knowledge of laboratory techniques is also necessary.

The physiological, nutritional, hormone, and statistical fields demand very specialized training and skills.

For research on control methods it is necessary that one be familiar with the life histories and habits of wildlife species that reach destructive abundance, and possess a knowledge of biochemistry, laboratory techniques, and field methods designed to reduce populations economically, and the use of deterrents and preventives.

To develop practical methods for the prevention and cure of animal maladies under natural conditions and on game and fur farms, a thorough knowledge of laboratory techniques and thorough training in diagnosis and the identification of endemic diseases, ectoparasites and endoparasites, tumors, and morbid tissues is necessary.

Wildlife-experiment stations and fur and game farms need personnel trained in wildlife production, with emphasis on the various factors affecting production. These include a knowledge of the principles of breeding, feeding, and management, as well as of diseases and their control.

In all cases, research workers must be able to recognize and interpret facts in their proper perspective and to report them scientifically. The school chosen by the student should offer training commensurate with these requirements.

Administration and management

Game managers engaged in the protection of favored species should be vamiliar with wildlife habitats, ranges, and economics. Familiarity with the techniques of law enforcement and a working knowledge of Federal and State laws and regulations is also necessary. They must know how to locate, develop, and manage wildlife refuges. Control of species harmful to crops, livestock, forests, forage, and desirable wildlife requires a knowledge of the habits of the major species to be controlled and techniques for controlling them.

Persons engaged in work concerned with wildlife in relation to forestry, soil conservation, flood control, reclamation, drainage, and grazing -- in fact, all phases of forest-wildlife, farm-wildlife, and aquatic-wildlife relations -- should be trained in basic science and have a technical knowledge with which to interpret and apply known facts, and a good background of animal and plant ecology. Some training in business administration and economics, silviculture, forestry, agriculture, animal husbandry, soils, dam construction, drainage, and navigation is desirable. The land administrator must be able to fit wildlife into a multiple land-use program.

Migratory-bird refuge administration requires persons familiar with life histories and habits of waterfowl, upland game birds, and fur animals; with aquatic vegetation suitable for food, cover, and nesting sites, and with techniques useful in improving them; and with the engineering phases of refuge management. Refuge managers must be informed on laws and regulations and be trained in handling personnel and equipment.

Local conservation officers or wardens should have a broad knowledge of fish and wildlife and the regulations relating to them, and the ability to enforce those regulations. Furthermore, they should be able to meet the public effectively and participate in wildlife-conservation education.

Teaching and extension

A broad technical background and wide experience in practical operations are desirable to men preparing for the wildlife-teaching profession. Effective teaching, since its function is to produce a continuous and ever-improved supply of trained wildlife workers, is one of the most vital branches in the still incompletely developed wildlife field.

Extension work, probably the least developed phase of the wildlife program, is the best way to acquaint the public with the principles of wildlife management and the methods of applying them. The specialist in extension work should have an understanding of agricultural science and economics and of extension teaching methods, and should have had several years of practical experience in wildlife work.

Outdoor writing

There are more than thirty million licensed fishermen, hunters, and trappers in the United States. Many of these are regular readers of outdoor periodicals, books, and newspaper columns. The paid circulation of the several outdoor magazines averages about half a million subscriptions. In addition many people find interest in occasional news stories or other copy on outdoor sports, recreation, and wildlife generally. Outdoor literature in one form or another reaches perhaps a third of our population, or more than fifty million people.

This interest in wildlife on the part of the public makes outdoor writing a means of furthering conservation education. The number of wildlife-trained writers who may find employment in this field cannot be estimated; however, most newspapers are interested in outdoor copy. Outdoor magazines carry staffs of practical experts, mainly sportsmen-writers. Obviously, this field offers real, though limited, opportunity for men with the proper combination of wildlife-journalistic training, who are capable of presenting sound scientific material in a popular style.

Wildlife photography and art work

Wildlife photography is a small but growing field with fascinating opportunities for top-flight photographers. Here, mastery of photographic techniques is the first requirement, but acquaintance with wildlife, habitats, and ecological relations is so obviously useful that without it wildlife photographers and artists find themselves handicapped. Some wildlife training is particularly desirable to those using photography in connection with writing and lecturing.

The ability to paint, draw, or sketch wildlife is of value not only to the artist who makes his living in this manner but also to research workers and conservation educators. Visual aids are becoming increasingly important in conservation education and extension work, and a properly illustrated publication or address is much more effective than one without illustrations.

TRAINING OFFERED

Academic training is prerequisite to practically every type of professional wildlife employment. This is due largely to the emphasis placed on the passing of a technical examination by which the candidate qualifies for a position on the

roster of eligibles. Both Federal and State agencies usually select technical employees in this general manner, often through a civil-service commission. Aside from the need to pass examinations, it is obvious that knowledge and skill can be acquired best by both formal training and practical experience.

Although most schools with wildlife curricula offer both undergraduate and graduate work on the subject, some give only undergraduate instruction and a few only graduate instruction.

Undergraduate

It is only on a thorough foundation in zoology, botany, and other related sciences that wildlife training can be effectively developed. It is therefore very important that the prospective wildlife worker obtain such a groundwork for his advanced training. Basic preliminary courses such as zoology, botany, geology, agronomy, mathematics, physics, and chemistry, as well as accompanying courses in social studies and humanities may be obtained at many institutions which do not offer specialized wildlife work. If preliminary training is obtained at one of these institutions it would be advisable to determine in advance the course requirements of the school selected for advanced work and whether credits could be transferred to that school.

Most schools offering the equivalent of a major in the wildlife field usually do so in the School of Forestry or Agriculture, but sometimes in the Department of Zoology or some other unit. The resulting degree is one of Bachelor of Forestry, Bachelor of Arts, Bachelor of Science, or a similar degree. Few schools offer the bachelor's degree in Wildlife Management as such.

Schools in which wildlife training is restricted to elective courses usually offer them in the Department of Zoology, Forestry, or Biology.

Graduate

The graduate schools of colleges and universities offer students (1) advanced courses, (2) seminars, and (3) research problems seeking original data under the direction of experienced instructors.

The graduate wildlife training and research programs of 17 colleges and universities have been augmented by the establishment of Cooperative Wildlife Research Units. This program, in which the colleges, the State conservation departments, the Wildlife Management Institute, and the Fish and Wildlife Service pool manpower, funds, equipment, and facilities is in operation at the institutions so designated in table 1. Scholarships and research fellowships are available at most of the institutions offering graduate training in wildlife management.

Courses and facilities

There is considerable similarity in the broad fields of training offered by institutions giving wildlife work. These fields, if broken down into courses, would naturally show variation in content, scope, and presentation. Some of the schools require a summer-camp course -- often in the School of Forestry. Other schools require field work under conditions more or less equivalent to those of a camp. A few of the larger schools offer summer work both in camps and in

biological stations. Practically all have access to experimental or demonstration areas. Museum study specimens are available in most schools, although few have really comprehensive collections.

Most schools have staff members engaged both in research and in teaching. In most schools, instructors outside the wildlife section or department, usually in the Division of Zoology, offer courses in mammalogy, ornithology, ichthyology, and related subjects. This arrangement, by which one division supplements the work of another, provides a broader and hence more satisfactory training. Relatively few schools have staff members concerned with extension work, despite the great need for this type of work.

EMPLOYMENT OPPORTUNITIES

There is a limited demand for persons trained in wildlife subjects in such Federal agencies as the Fish and Wildlife Service, the Forest Service, the National Park Service, the Bureau of Indian Affairs, Soil Conservation Service, and, during recent years, the Corps of Engineers, United States Army. Practically all State fish and game departments now employ, in administrative, management, or research capacities, small to large staffs of men with such technical training.

Schools offering wildlife curricula necessarily employ instructors with wildlife training and, in nearly all cases, those with practical experience as well. These and other institutions conduct wildlife research requiring highly trained specialists. During recent years, private interests have absorbed a small number of men trained in wildlife matters, mostly in large waterfowl or other hunting clubs and on estates and in a few industrial laboratories. Commercial interests concerned with wildlife, such as fur establishments and fisheries, offer employment to a limited number of specially qualified persons.

During the four years 1950 to 1953, college graduates obtaining positions in the wildlife-conservation field were employed as follows: by State and Provincial conservation agencies, approximately 70%; by Federal agencies, 15-20%; by educational institutions as teachers, 5-10%; and by private agencies or individuals, 2-5%.

There is great need for improvement and expansion of wildlife programs among Federal agencies and in the State fish and game departments. Obviously, expansion in the colleges and universities is limited by the overall demand for trained men. There is room, however, for increased offerings at colleges and universities of conservation courses, taken as cultural subjects by students not majoring in wildlife. There is room for expansion also in conservation education at the primary and secondary levels. Private employment in wildlife work, now in its infancy, should grow. The outdoor-writing profession, now manned mostly by sportsmen, currently offers a limited but important field for persons trained in both wildlife matters and journalism. Wildlife photography is a new and growing profession.

Employment opportunities for wildlife research men are probably more limited than those in wildlife management. There appears to be a trend for State conservation departments to employ more college-trained men in local conservation-officer or warden positions and in public-relations or conservation-education work. This phase of the work, in which the employee deals with fish and game management, law enforcement, and conservation education through public contacts, would seem to offer possibilities for employment not yet fully developed.

TABLE 1.--Partial List of Colleges and Universities Offering Wildlife Training

Alabama
Alabama Polytechnic Institute 1/
Auburn, Alabama

Alaska
University of Alaska 1/
College, Alaska

Arizona
University of Arizona 1/
Tucson, Arizona

California
University of California
Berkeley, California

University of California
Davis, California

University of California
Los Angeles, California

Humboldt State College
Arcata, California

California State Poly. College
San Luis Obispo, California

Colorado
Colorado A & M College 1/
Fort Collins, Colorado

Connecticut
University of Connecticut
Storrs, Connecticut

Florida
University of Florida
Gainesville, Florida

Georgia
University of Georgia
Athens, Georgia

Idaho
University of Idaho 1/
Moscow, Idaho

Illinois
University of Illinois
Champaign, Illinois

Southern Illinois University
Carbondale, Illinois

Indiana
Purdue University
Lafayette, Indiana

Iowa
Iowa State College 1/
Ames, Iowa

Kansas
University of Kansas
Lawrence, Kansas

Louisiana
Louisiana State University
Baton Rouge, Louisiana

Maine
University of Maine 1/
Orono, Maine

Massachusetts
University of Massachusetts 1/
Amherst, Massachusetts

Michigan
Michigan State College
East Lansing, Michigan

University of Michigan
Ann Arbor, Michigan

Minnesota
University of Minnesota
University Farm
St. Paul 1, Minnesota

Missouri
University of Missouri 1/
Columbia, Missouri

1/ Colleges or universities with Cooperative Wildlife Research Units

Montana
Montana State University 1/
Missoula, Montana

Montana State College
Bozeman, Montana

Nebraska
University of Nebraska
Lincoln, Nebraska

Nevada
University of Nevada
Reno, Nevada

New Hampshire
University of New Hampshire
Durham, New Hampshire

New Jersey
Rutgers University
New Brunswick, New Jersey

New York
Cornell University
Ithaca, New York

Syracuse University
Syracuse, New York

North Carolina
North Carolina State College
Raleigh, North Carolina

Ohio
Ohio State University 1/
Columbus, Ohio

Oklahoma
Oklahoma A & M College 1/
Stillwater, Oklahoma

University of Oklahoma
Norman, Oklahoma

Oregon
Oregon State College 1/
Corvallis, Oregon

Pennsylvania
Pennsylvania State University 1/
State College, Pennsylvania

Rhode Island
University of Rhode Island
Kingston, Rhode Island

South Dakota
South Dakota State College
Brookings, South Dakota

Texas
Texas A & M College 1/
College Station, Texas

University of Texas
Austin, Texas

Utah
Utah State Agricultural College 1/
Logan, Utah

Virginia
Virginia Polytechnic Institute 1/
Blacksburg, Virginia

Washington
State College of Washington
Pullman, Washington

University of Washington
Seattle, Washington

West Virginia
University of West Virginia
Morgantown, West Virginia

Wisconsin
University of Wisconsin
Madison, Wisconsin

Wyoming
University of Wyoming
Laramie, Wyoming

British Columbia
University of British Columbia
Vancouver, British Columbia, Canada

Ontario
Ontario Agricultural College
Guelph, Ontario, Canada

Toronto
University of Toronto
Toronto 5, Ontario, Canada

1/ Colleges or universities with Cooperative Wildlife Research Units

BIBLIOGRAPHY

BENNITT, RUDOLF

1942. The nature and scope of training graduates in wildlife conservation. Seventh North American Wildl. Conf. Trans., pp. 495-505.

1946. University objectives in professional wildlife training. Jour. Wildl. Mangt., 10:218-227.

BRISTOW, WILLIAM H., AND COOK, KATHERINE M.

1937. Conservation in the education program. U. S. Dept. Int. Office of Education, Bull. 4 78 pp.

DAVIS, WILLIAM B.

1943. A wildlife conservation teaching program. Eighth North Amer. Wildl. Conf. Trans., pp. 198-205.

DEASON, H. J.

1941. A survey of academic qualifications for fishery biologists and of institutional facilities for training fishery biologists. Amer. Fisheries Soc. Trans. (for 1940), Vol. 70, pp. 128-142. Reprinted as Fishery Leaflet 101 by the Fish and Wildlife Service, U. S. Dept. of the Interior.

ENGLISH, P. F.

1942. The nature and scope of training undergraduates in the field of wildlife conservation. Seventh North Amer. Wildl. Conf. Trans., pp. 489-494.

ERRINGTON, PAUL L.

1934. Wildlife research as a profession. Sci. Monthly 38:554-460.

GRAHAM, SAMUEL A.

1943. An outdoor living and physical training course. Eighth North Amer. Wildl. Conf. Trans., pp. 191-195.

KING, RALPH T.

1938. What constitutes training in wildlife management? Third North Amer. Wildl. Conf. Trans., pp. 548-557.

LANGLOIS, THOMAS A.

1942. The role of universities in conservation education. Wildlife Society Newsletter, 2:6-7.

LEEDY, DANIEL L.

1953. Biologists in the field of wildlife conservation. AIBS Bulletin 3(2):21-23.

LEOPOLD, ALDO

1942. The role of wildlife in a liberal education. Seventh North Amer. Wildl. Conf. Trans., pp. 485-489, illus.

LEOPOLD, ALDO, et al.

1939. Academic and professional training in wildlife work. Jour. Wildl. Mangt., 3:156-161.

NATIONAL ASSOCIATION OF BIOLOGY TEACHERS

1954. Training the conservation worker. A symposium appearing in the AIBS Bulletin dated January 1954, and consisting of the following papers:

O. F. HALL. Resource management emphasis in training technical foresters. Page 21.

ROBERT A. McCABE. Training in wildlife management. Page 22.

KARL F. LAGLER. Preparation for fishery research and management. Page 23.

WILLIAM H. MARSHALL. Necessity for background in the training of the conservation worker. Pages 23-24.

RICHARD L. WEAVER. Preparing teachers of conservation. Pages 24-25.

RUTHERFORD, R. M., et al.

1947. Wildlife and fishery employment now and later. The Wildlife Society Newsletter, Jan. pp. 1-4.

TURNER, DAVID B.

1947. Professional opportunities in the fish and wildlife field. Twelfth North American Wildl. Conf. Trans., pp. 102-115.

1948. Professional opportunities in the wildlife field. Published jointly by the American Nature Association and the Wildlife Mangt. Institute, pp. 1-208.

VAN DERSAL, WILLIAM R.

1942. The viewpoint of employers in the field of wildlife conservation. Seventh North Amer. Wildl. Conf. Trans., pp. 506-517.

WILDLIFE SOCIETY - Annual reports of the Committees on Employment, Professional Standards and Research needs as published in the July issues of the Journal of Wildlife Management.

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